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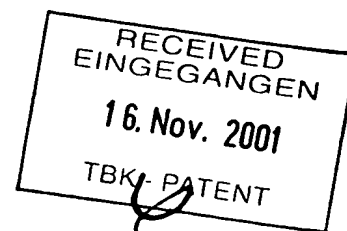
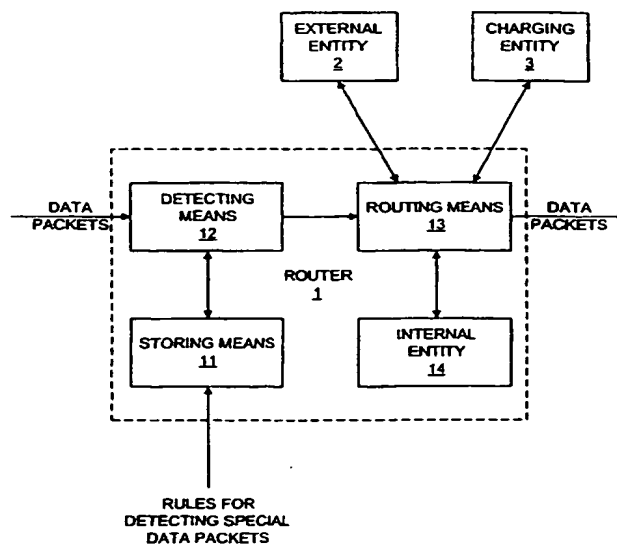
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(54) Title: INTELLIGENT DATA NETWORK ROUTER



(57) Abstract: According to the present invention, a plurality of data packets are received and routed by a router (1) in a data network. The router (1) comprises storing means (11) for storing a pre-defined list of rules for detecting special data packets, detecting means (12) for detecting special data packets in the received plurality of data packets on the basis of the pre-defined list of rules stored in said storing means (11), and routing means (13) for requesting instructions for the special data packets detected by said detecting means (12) and for routing the special data packets in accordance with instructions received on request. According to the present invention, an advanced service architecture for next generation network services is provided. In this service architecture, the functions of the detecting means (12) and the routing means (13) can be achieved by a service trigger and a service logic, respectively.

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TITLE OF THE INVENTION

Advanced service architecture for next generation network services and intelligent data network router.

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FIELD OF THE INVENTION

The present invention relates to packet data transmission between mobile networks supporting Internet Protocol (IP) like the General Packet Radio Service (GPRS) network and data networks like the Internet, and in particular to a method and an apparatus for receiving and routing data packets in a data network. Moreover, the present invention relates to a method and an apparatus for receiving data packets and providing services for the received data packets in a data network.

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15BACKGROUND OF THE INVENTION

Data or packet-switched networks like the Internet comprise routers for routing data packets in the data network. In a conventional router, routing of data packets is affected by a classifier for detecting incoming data packets. The conventional Internet routers comprise semi-static routing tables for routing the data packets, the routing tables being updated only via separate management procedures or via dialog between routers using special routing protocols.

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However, with conventional routers several problems arise. In case of new routers propagating with conventional routing protocols, propagation of data packets in the network is slow and a dynamic update of routers is not easy, since all routers must know the handling of all packets and if the handling for one user changes all routing tables in all routers must be updated. Consequently, the routing tables of conventional routers are getting large. If every user wants

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his own packet handling the routing tables grow too much for the routers.

Moreover, similar problems arise with a conventional service model in a packet data environment. The conventional service model consists of a service trigger and a service logic which may be located in a router. Such model does not provide the flexibility required by the advanced services in the packet data domain.

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SUMMARY OF THE INVENTION

It is an object of the present invention to improve routing possibilities by providing dynamically and per user configurable routing in a data network as well as a dynamic and flexible service architecture.

According to a first aspect of the present invention, there is provided an apparatus for receiving a plurality of data packets and for routing the data packets in a data network. This apparatus comprises storing means for storing a pre-defined list of rules for detecting special data packets, detecting means for detecting special data packets in the received plurality of data packets on the basis of the pre-defined list of rules stored in the storing means, and routing means for requesting instructions for the special data packets detected by the detecting means and for routing the special data packets in accordance with instructions received on request.

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Furthermore, according to the first aspect of the present invention, there is provided a method for receiving a plurality of data packets and for routing the data packets in a data network. According to this method, a pre-defined list of rules for detecting special data packets is stored, special data packets in the received plurality of data

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packets are detected on the basis of the stored pre-defined list of rules, and instructions for the detected special data packets are requested and the special data packets are routed in accordance with instructions received on request.

5

Furthermore, there is provided a data network system in which the apparatus according to the first aspect of the present invention is employed.

10 The apparatus according to the first aspect of the present invention further comprises an internal entity. Detected special data packets are notified to the internal entity by the routing means which requests instructions for the special data packets therefrom.

15

Alternatively, the routing means notifies an external entity of the detected special data packets and requests instructions for the special data packets therefrom.

20 According to the present invention, routing in accordance with instructions received on request also includes the "normal routing" possibility where a command from the external or internal entity states that no special routing is necessary, for example when only statistics and information
25 is to be collected but no special routing is required.

According to the present invention, the original rules that indicate which packets are special packets and need special handling are stored in the storing means by the external
30 entity.

Moreover, the rules stored in the storing means as well as the instructions stored in the internal entity can be dynamically determined and updated in real-time in response
35 to events, which are detected by the detecting means and reported by the routing means to the external entity. Thus,

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the content of the storing means and the internal entity can be changed "on the fly", i.e. during active operations. The internal entity may also update, add or remove some rules.

- 5 For example, the external entity may store some rules to detect special packets. When such a packet arrives in the router the external or internal entity may modify the rules, e.g. remove the specific rule if only the first matching packet was of interest.

10

In routing the special data packets, the routing means is able to modify the special data packets in accordance with the received instructions. For example, the routing means can modify the content of the data packets, e.g. the packet
15 headers, it can duplicate data packets or control dropping of data packets.

Moreover, according to the present invention, the routing means is able to communicate with an external charging entity
20 for charging the routing of the special data packets. For example, the routing means can collect charging information from the charging entity and send charging information to the charging entity. In this way, the special handling of data packets can be charged.

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For example, the detection of special packets can be based on any data within the special packet including but not limited to the source or destination IP address, TCP/UDP
(Transmission Control Protocol/User Datagram Protocol) port
30 numbers or other IP/UDP/TCP header fields. In other words, the pre-defined list of rules for detecting special packets can include such packet identification marks.

According to a second aspect of the present invention, there
35 is provided an apparatus for receiving a plurality of data packets and for providing services for the data packets in a

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data network. This apparatus comprises service deciding means for deciding services to be executed for the received plurality of data packets, and service executing means launched by the service deciding means for a decided service.

- 5 The service executing means executes the decided service for the received data packets. Control means are activated when the service executing means are launched, and control the service deciding means and the service executing means.
- 10 In addition, according to the second aspect, there is provided a method of receiving a plurality of data packets and providing services for the data packets in a data network. In this method, services to be executed for the received plurality of data packets are decided and a service
- 15 decided for the received data packets is launched. Control means are activated for the decided service, and the decided service is executed, wherein the control means control the deciding of services and the execution of decided services.
- 20 Finally, according to the present invention, there is provided a data network system in which an apparatus according to the second aspect is employed.

The apparatus according to the second aspect further

25 comprises a database for storing service deciding information which can be read by the service deciding means from the database.

Furthermore, the apparatus comprises service data storing

30 means for storing service specific data that is used by the service executing means. The service specific data comprises the data to run a specific service. For example, the service specific data for the premium rate service is the destination address and tariff.

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The service specific data is not part of the service executing means. For example, in case an advertisement adding service is launched, the service deciding means know when to insert the advertisements, the service executing means know
5 how to insert the advertisements and the service specific data contains the actual advertisements. The service specific data may be static or dynamic. For example, it may be dynamic for an advertisement service using location dependent advertisements.

10

The control means is arranged to access user specific data and to supply the user specific data to the service executing means. The user specific data comprises user preferences regarding a specific service. For example, the user specific
15 data can contain user preferences regarding advertisement selection or packet filtering options in a firewall service.

When a service is launched, the corresponding control means is also activated. Now, the service executing means is able
20 to contact the control means during its execution. For example, in case the service executing means needs user interaction, the control means is able to ask the user and pass the answer to the service executing means.

25

In addition, the control means is arranged to create new deciding information for the service deciding means. The control means can create new deciding information for a current service, it can delete deciding information or it can
30 activate a totally new service. Thus, new deciding information for the service deciding means, i.e. triggers, can be created on the fly and added to an active service by the control means.

35 In a packet data environment, the service executing means may be located in the router, while the control means may be

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located in the Service Control Point (SCP). The router may route the data packets received by the service deciding means in accordance with the services executed on the data packets by the service executing means.

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According to an embodiment of the second aspect of the present invention, the service deciding means are called service trigger(s), the service executing means are called service logic and the control means are called event handler.

10 According to Intelligent Network (IN) functional entities, the functions of the service trigger may be implemented in a Service Switching Function (SSF), the service logic may be represented by a Service Logic Program (SLP) and the functionality of the event handler may be performed in a
15 Service Management Point (SMP) and a Specialized Resource Function (SRF), in order to perform message based user interaction according to the Wireless Application Protocol (WAP) or Unstructured Supplementary Service Data (USSD). The service specific data and user specific data may be stored in
20 an SCP database or Service Data Function (SDF) database.

With the special packet handling according to the present invention, it is enough for the router to know that some kind of special handling is needed for special packets. In
25 practice, this means that part of the routing tables can be located in an external entity from which the router requests instructions when needed.

Moreover, with the handling of special packets it is easy to
30 manage scenarios that involve more than one router. For example, a tunnel can dynamically be created from one router to another through special packet handling rules and with the help of an external entity connected to both routers involved in the tunnel. Different external entities may also be
35 connected to each other. On the other hand, one router may be connected to different external entities.

According to the present invention, more intelligence is given to a data network router, enabling implementation of more versatile and dynamic services for users.

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In this context, reliable and fast delivery of high priority data packets can be guaranteed. That is, according to the present invention, the delay problem in using IP for real-time applications can be reduced or even eliminated.

10

Moreover, according to the present invention, a service architecture is presented, which uses techniques such as event handler interaction, trigger updating and service or user specific data updating, to control and execute services in a more dynamic way.

15

Thus, according to the presented service architecture, the implementation of data services with advanced features for data networks is facilitated.

20

In the following the present invention will be described by way of preferred embodiments thereof with reference to the accompanying drawings.

25 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a schematic block diagram of the basic components of a router according to a first embodiment of the present invention;

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Fig. 2 shows a flowchart of the basic steps of a method according to the first embodiment of the present invention;

Fig. 3 shows a schematic block diagram of the basic components of a service architecture according to a second embodiment of the present invention; and

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Fig. 4 shows a flowchart of the basic steps of a method according to the second embodiment of the present invention.

5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 shows a schematic block diagram of a router in a data network like the Internet according to a first embodiment of the present invention. The router 1 comprises storing means
10 11, detecting means 12, routing means 13 and an internal entity 14.

The detecting means 12 receives data packets from a subscriber of a mobile network supporting Internet Protocol
15 like the GPRS network, or data packets which are originated in the data network. In receiving the data packets, the detecting means 12 checks these packets on special packets requiring special handling by the routing means 13, by referring to a pre-defined list of rules for detecting
20 special packets, that is stored in the storing means 11.

When the detecting means 12 detects a special packet, it informs the routing means 13 and forwards the special packet to it. Subsequently, the routing means 13 notifies the
25 detection of a special packet to the internal entity 14 or an external entity 2, requesting instructions for handling the special packet. Having received the requested instructions, the routing means 13 handles the special data packets in accordance with these instructions, for example modifies the
30 packet and outputs or routes it accordingly.

The routing means 13 also communicates with a charging entity 3 for providing charging for some special handling of packets. The charging entity 3 is in a way just another
35 external entity receiving charging related events from the router 1.

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The contents of the storing means 11 and the internal entity 14 can be updated dynamically in real-time by the external entity 2 in response to events detected by the detecting means 12 and reported to the external entity 2 by the routing means 13.

A method for receiving and routing data packets according to the first embodiment of the present invention will be described with reference to Fig. 2.

In step S1 in Fig. 2, rules for detecting special data packets are stored in a list in the storing means 11. In step S2, data packets are received and it is checked in step S3, whether a received data packet is a special data packet, by referring to the stored rules. If a special data packet is detected in step S3, instructions for handling the special packet are requested in step S4. After having received the requested instructions, the special packet is handled accordingly in step S5.

On the other hand, in case no special data packet is detected in step S3, the "normal" data packet is routed according to a routing table (not shown in Fig. 1) by the routing means 13 (step S6), the routing table being provided in the router 1.

Next, a second embodiment of the present invention will be described with reference to Figs. 3 and 4.

Fig. 3 shows a service architecture which is suitable for next generation services, in particular packet data services. As shown in Fig. 3, a service trigger 42 receives data packets. The service trigger 42 then decides whether to launch a service logic 43 or not. In case the service trigger 42 launches the service logic 43, the service logic 43 executes the service decided by the service trigger 42. The

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service trigger 42 reads trigger information from a database 41.

When the service logic 43 is launched by the service trigger 42, a corresponding event handler 5 is also activated. The service logic 43 is able to contact the event handler during its execution. In case the service logic 43 needs user interaction, the event handler 5 is able to ask the user and pass the answer to the service logic 43. The event handler 5 can create new triggers or trigger information for the current service executed in the service logic 43, it can delete a trigger or it can activate a totally new service. In other words, new triggers or trigger information can be created "on the fly" and added to an active service by the event handler 5. In addition, the event handler 5 is able to access user specific data 6 containing user preferences regarding a specific service.

The service logic 43 accesses service specific data 44 which comprises data to run a specific service, for example destination address and tariff data for a premium rate service. The service specific data 44 is not part of the actual logic.

In an IN packet data environment, the service logic 43 may be located in a router, and the event handler may be located in an SCP (Service Control Point). For example, in case packet data is sent via an SSP (Service Switching Point) to the service trigger 42, the service trigger 42 checks whether to send a message to the SCP. If the service trigger 42 sends the message, this message is received by a dialog handler in the SCP. The dialog handler passes the message to the event handler 5 which may ask the user whether a service for the packet data, which is to be executed in the service logic 43 should be activated. The result is passed to the service logic 43. In case the user decides to activate the service,

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the SCP allows the SSP to continue the sending of packet data.

Fig. 4 shows a flowchart illustrating the basic steps of the method of receiving data packets and providing services for the data packets according to the present invention. In step S51, the service trigger 42 receives data packets, for example from an SSP. In step S52, the service trigger 42 decides whether a service is to be executed for the received data packets.

In case the service trigger 42 decides in step S53 on the basis of the trigger information in the database 41 that no service is required for the received data packets the process is terminated. In contrast thereto, in case a service is required, the process goes to step S54 where the service logic 43 is launched for the service to be executed. After that, in step S55, the event handler 5 corresponding to the service logic 43 is activated. In this context, the service trigger 42 may contact the event handler 5 as mentioned above, which may ask the user whether the decided service should be activated. In case the decided service should be activated, the service is executed by the service logic 43 in step S56, and then the process is terminated.

The data packets for which a service has been executed by the service logic 43 can be routed in accordance with this service. Hence, the above-described service architecture basically corresponds to the arrangement of the router 1 as shown in Fig. 1. In other words, the service trigger 42, the service logic 43 and the event handler 5 respectively provide similar functions as the detecting means 12, the routing means 13 and the external entity 2 according to Fig. 1.

In order to activate a service for a specific user according to the present invention it is required to get appropriate

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service trigger(s), service logic and event handler. The choice of the appropriate event handler may for example depend on what kind of terminal type is used by the user, e.g. GSM (Global System for Mobile communications), WAP

5 (Wireless Application Protocol) or GPRS (General Packet Radio Service), if user interaction is required. In a group service there can also exist different event handlers with different access rights for the group members. The group owner can have a more powerful event handler than other group members, i.e.
10 the owner's event handler can be allowed to modify the triggers for the service while others are not. A further step in activating a service is to load any service specific data that is needed statically. Dynamic service specific data is loaded by the service logic. The final step is to get the
15 user specific data for the service.

In the following, a first application example of the present invention relating to the delay problem in using IP for real-time applications will be described.

20

A rule for detecting special packets may be the determination of the priority of a packet. According to the first application example, the priority of a data packet can be determined by comparing the destination number corresponding
25 to E.164 or the IP address of the received packet with the numbers or addresses stored in connection with the corresponding rule in the storing means 11. For example, when the destination number or IP address of the packet is listed in the corresponding rule, the packet is a special data
30 packet having high priority. The priority of a data packet can also be detected by checking the content of the packet, e.g. the protocol header, as to whether this content is listed in the corresponding rule..

35 In case a special data packet, i.e. a packet having high priority such as an emergency call, is detected by the

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detecting means 12, the routing means 13 is informed and notifies the detection to the internal or external entity and requests instructions for handling the special data packet. Thereupon, the internal or external entity informs the
5 routing means 13 that the delivery of the special packet is to be prioritized, which then is carried out by the routing means 13.

10 With this first application example of the present invention, reliable and fast delivery of high priority data packets can be guaranteed. That is, according to the present invention, the delay problem in using IP for real-time applications can be reduced or even eliminated.

15 Next, a second application example of the present invention relating to family or group service for data networks will be described.

20 The purpose of the family service is to provide a convenient method to define a user group and various properties for the group members. The service is targeted for families or small companies. The context of the service is mobile networks supporting Internet Protocol, such as GPRS.

25 As the use of data services gets more popular, the user group concept is a convenient way to add value to small companies or families. A group consists of a set of predefined users, recognized by SIM (Subscriber Identity Module) cards or passwords or the like. For example, the predefined users can
30 be the members of a particular family. Each group and every member of the respective groups has properties that can be used to restrict or allow different operations. For example, parents might want to restrict the use of WAP (Wireless Application Part) services during school hours, or only allow
35 access to pre-defined content sites. The group can have

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different properties for different users or a single property can be applied to all members of the group.

According to the second application example, the rule is to
5 determine data packets belonging to members of a group. For
this purpose, a list of groups and for each group a list of
current members is provided in the storing means 11. In other
words, in a corresponding rule in the list of rules stored in
the storing means 11, group IP addresses and member IP
10 addresses are listed.

As mentioned above, each group and each member of the group
can have a set of properties. An owner like the family head
paying the phone bill is defined for each group. The owner is
15 allowed to modify the properties of the group members. A
group can have multiple owners. The group member properties
define the access rights for the members. Examples for
properties are allowed IP addresses, allowed access times,
allowed maximum access times, and the like.

20 According to GPRS, the above-mentioned properties can be
defined in the GGSN (Gateway GPRS Support Node) representing
the external entity according to Fig. 1. The GGSN is also
able to supply the group IP addresses and member IP addresses
25 to the storing means 11.

For example, when the detecting means 12 detects that a
packet is to be transmitted to a group member by comparing
the destination IP address of the packet with the address
30 listed in the corresponding rule stored in the storing means
11, it informs the routing means 13 which notifies the
detected packet to the GGSN and requests instructions from
the GGSN for handling the detected special packet. The GGSN
may determine upon this request that the special packet was
35 originated from an unallowed IP address or at an unallowed
access time or that the maximum access time has been

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exceeded, and instructs the routing means 13 to drop the packet.

5 Alternatively, packets coming from certain group members, i.e. packets having a certain source IP address, can be dropped by the routing means 13 in accordance with instructions received from the GGSN.

10 Hence, according to the second application example of the present invention, a censoring function is implemented in the router 1 simply by adding a rule for detecting special packets. That is, according to the present invention, the implementation of family or group services for data networks is facilitated.

15

While the invention has been described with reference to preferred embodiments, the description is illustrative of the invention and is not to be construed as limiting the invention. Various modifications and applications may occur
20 to those skilled in the art without departing from the true spirit and scope of the invention as defined by the appended claims.

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CLAIMS:

1. An apparatus (1) for receiving a plurality of data packets and for routing the data packets in a data network,

5 comprising:

storing means (11) for storing a pre-defined list of rules for detecting special data packets;

10 detecting means (12) for detecting special data packets in the received plurality of data packets on the basis of the pre-defined list of rules stored in said storing means (11); and

routing means (13) for requesting instructions for the special data packets detected by said detecting means (12) and for routing the special data packets in accordance with
15 instructions received on request.

2. The apparatus according to claim 1, further comprising an internal entity (14); wherein said routing means (13) notifies said internal entity (14) of the detected special
20 data packets and requests instructions for the special data packets from said internal entity (14).

3. The apparatus according to claim 1, wherein said routing means (13) notifies an external entity (2) of the detected
25 special data packets and requests instructions for the special data packets from said external entity (2).

4. The apparatus according to claim 1, wherein the rules stored in said storing means (11) and the instructions stored
30 in said internal entity (14) can be determined and updated from said external entity (2) during active operations.

5. The apparatus according to claim 1, wherein said routing means (13) modifies the special data packets in accordance
35 with the received instructions.

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6. The apparatus according to claim 1, wherein said routing means (13) communicates with an external charging entity (3) for charging the routing of the special data packets.
- 5 7. An apparatus for receiving a plurality of data packets and for providing services for the data packets in a data network, comprising:
- service deciding means (42) for deciding services to be executed for the received plurality of data packets; and
- 10 service executing means (43) launched by said service deciding means (42) for a decided service, said service executing means (43) executing the decided service for the received data packets;
- wherein control means (5) are activated when said
- 15 service executing means are launched, said control means (5) controlling said service deciding means (42) and said service executing means (43).
8. The apparatus according to claim 7, further comprising a
- 20 database (41) for storing service deciding information for said service deciding means (42).
9. The apparatus according to claim 7, further comprising service data storing means (44) for storing service specific
- 25 data that is used by said service executing means (43).
10. The apparatus according to claim 9, wherein said service specific data comprise static and dynamic data.
- 30 11. The apparatus according to claim 7, wherein said control means (5) is arranged to access user specific data (6) and to supply said user specific data to said service executing means (43).

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12. The apparatus according to claim 11, wherein the user specific data comprise user preferences regarding a specific service.

5 13. The apparatus according to claim 7, wherein said control means (5) is arranged to create new deciding information for said service deciding means (42).

10 14. A method of receiving a plurality of data packets and routing the data packets in a data network, comprising the steps of:

storing (S1) a pre-defined list of rules for detecting special data packets;

15 detecting (S3) special data packets in the received plurality of data packets on the basis of the stored pre-defined list of rules; and

requesting (S4) instructions for the detected special data packets and routing (S5) the special data packets in accordance with instructions received on request.

20

15. The method according to claim 14, wherein said requesting step (S4) comprises the steps of:

notifying an internal entity (14) of the detected special data packets; and

25 requesting instructions for the special data packets from said internal entity (14).

16. The method according to claim 14, wherein said requesting step (S4) comprises the steps of:

30 notifying an external entity (2) of the detected special data packets; and

requesting instructions for the special data packets from said external entity (2).

35 17. The method according to claim 14, wherein the rules stored in said storing step and the instructions stored in

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said internal entity (14) can be determined and updated by said external entity (2) during active operations.

18. The method according to claim 14, wherein said routing
5 step (S5) comprises the step of:

modifying the special data packets in accordance with the received instructions.

19. The method according to claim 14, comprising the further
10 step of:

communicating with an external charging entity (3) for charging the routing of the special data packets.

20. A method of receiving a plurality of data packets and
15 providing services for the data packets in a data network, comprising the steps of:

deciding (S52) services to be executed for the received plurality of data packets;

20 launching (S54) a service decided for the received data packets;

activating (S55) control means (5) for the decided service; and

executing (S56) the decided service;

25 wherein said control means (5) control the deciding of services and the execution of decided services.

21. The method according to claim 20, further comprising the
30 step of storing service deciding information for said deciding step (S52).

22. The method according to claim 20, further comprising the
step of storing service specific data (44) that is used in said executing step (S56).

35 23. The method according to claim 22, wherein said service specific data comprise static and dynamic data.

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24. The method according to claim 20, wherein said control means (5) is arranged to access user specific data (6) and to supply said user specific data to said executing step (S56).

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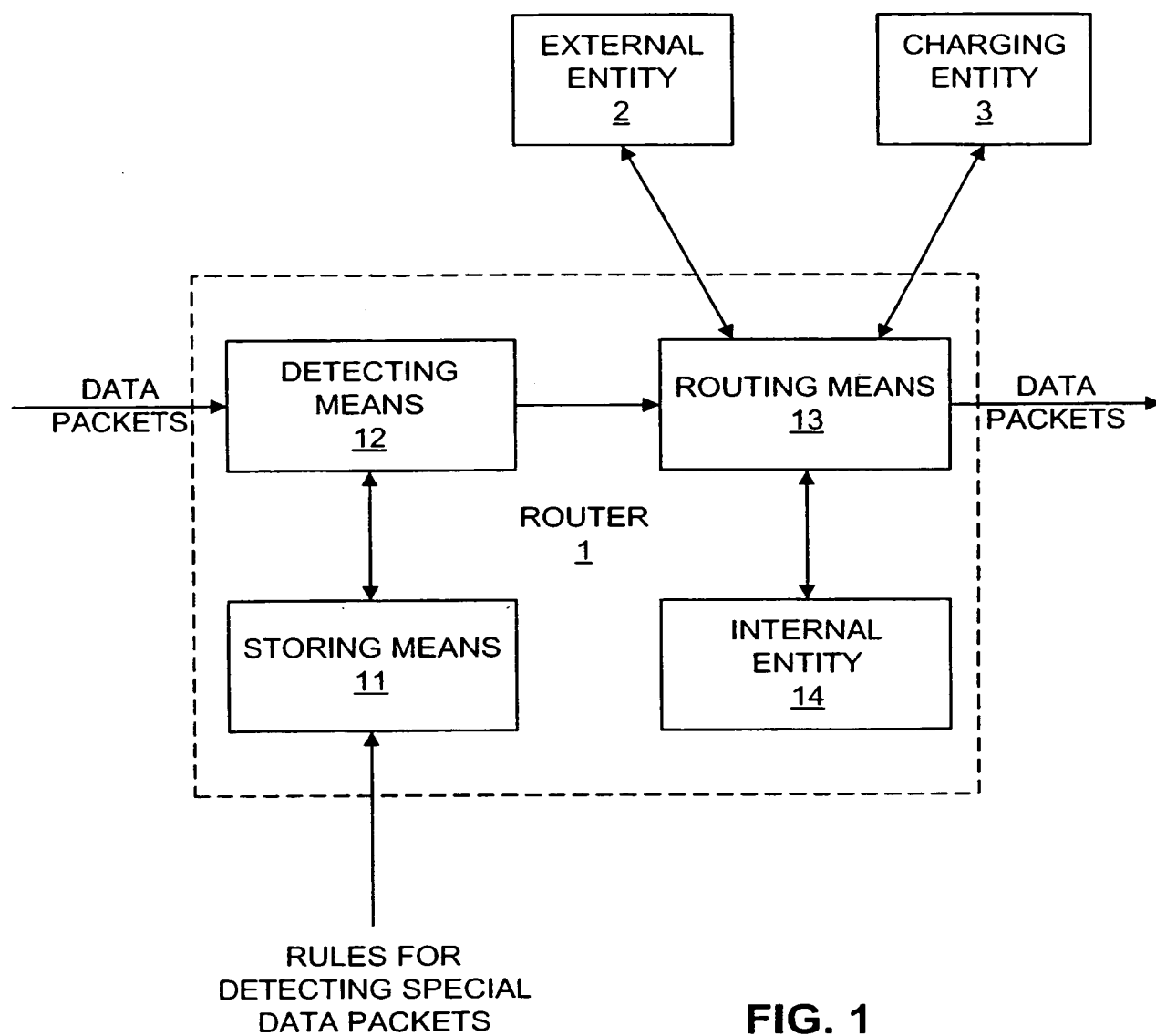
25. The method according to claim 24, wherein the user specific data comprise user preferences regarding a specific service.

10 26. The method according to claim 20, wherein said control means (5) is arranged to create new deciding information for said deciding step (S52).

15 27. A data network system in which an apparatus according to any one of claims 1 to 6 is employed.

28. A data network system in which an apparatus according to any one of claims 7 to 13 is employed.

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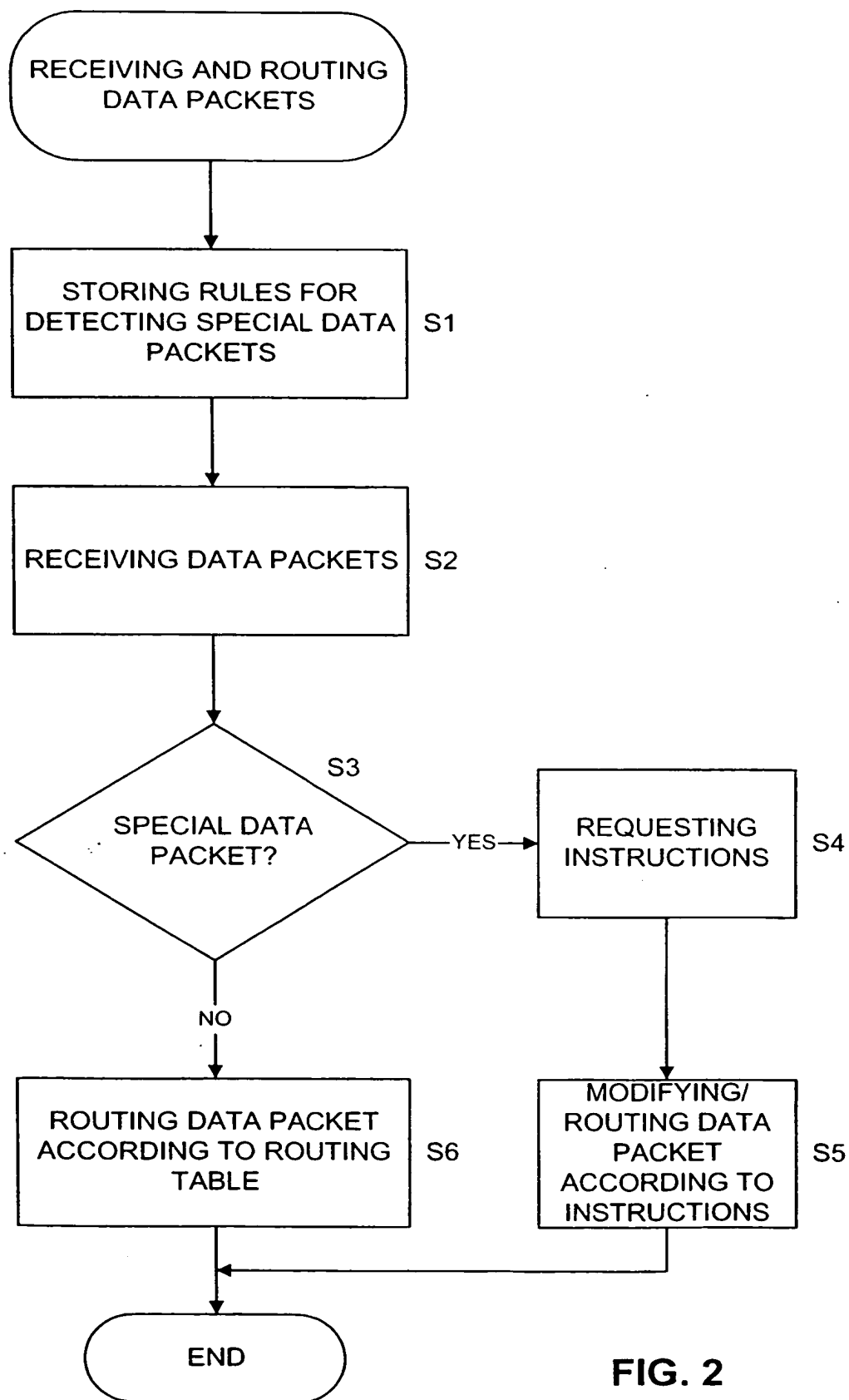


FIG. 2

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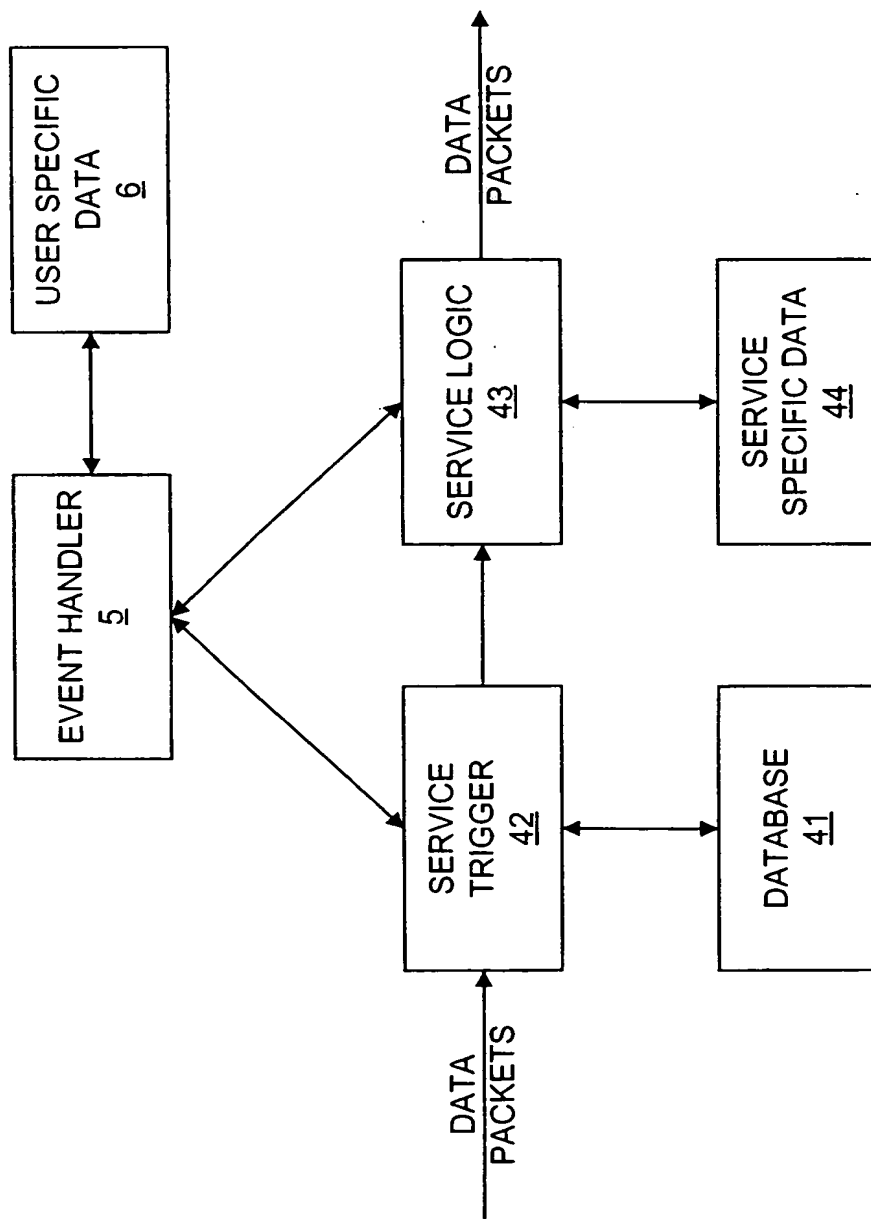


FIG. 3

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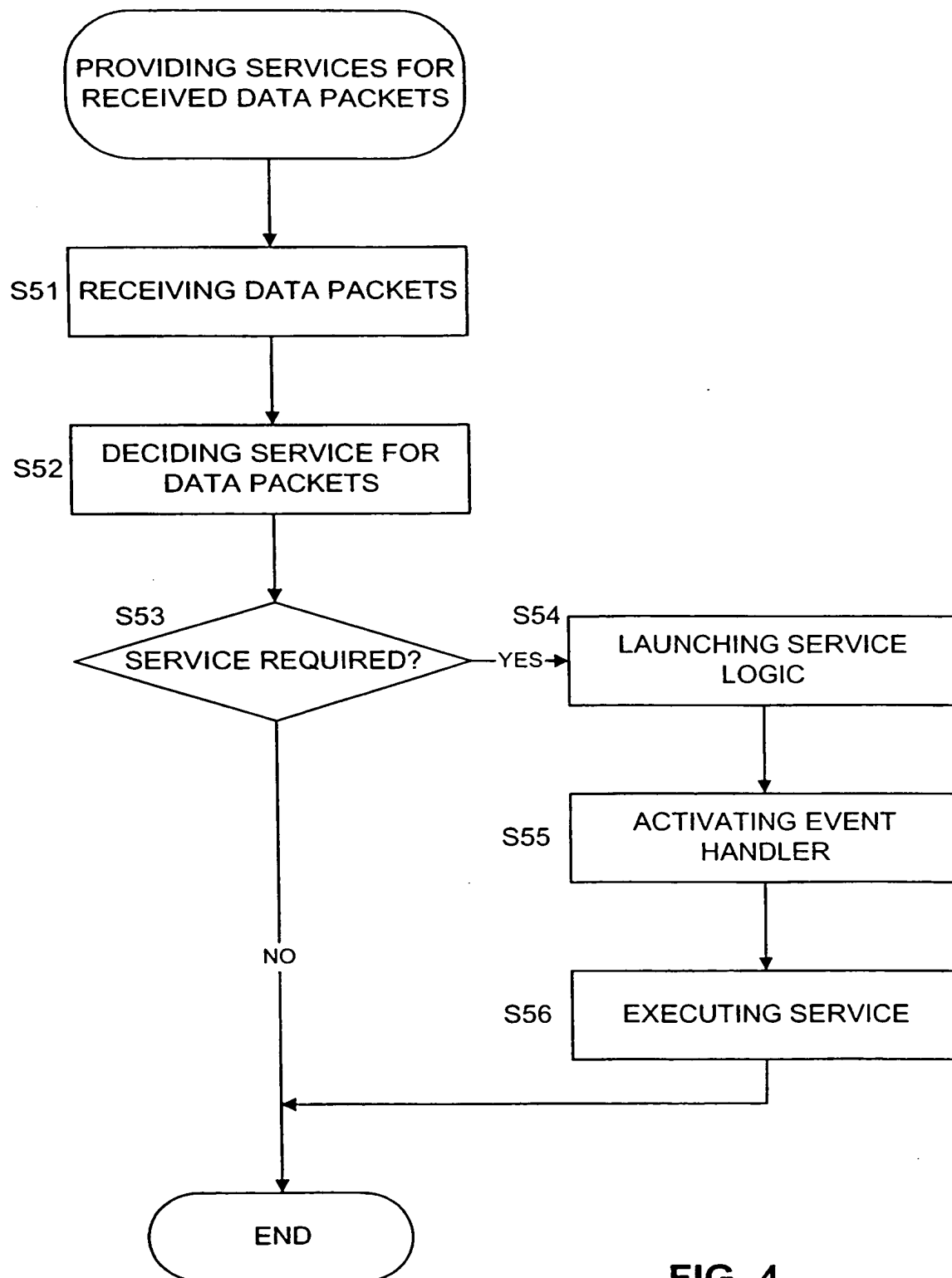


FIG. 4

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INTERNATIONAL SEARCH REPORT

Int. Application No

PCT/EP 00/03478

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L12/56 H04L29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 745 488 A (FELDMEIER DAVID C ET AL) 28 April 1998 (1998-04-28) abstract column 3, line 65 -column 4, line 35	1,2,14, 15,27
A	column 7, line 1 - line 20 claim 1; figure 5	3,4,16, 17
X	WO 99 00737 A (SUN MICROSYSTEMS INC) 7 January 1999 (1999-01-07) abstract claims 1,2,33; figure 3 -/-	1,5,14, 18

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

11 July 2001

Date of mailing of the international search report

30. 07. 2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Blanco Cardona, P

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 00/03478

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 00946 A (ARKKO JARI ;ERICSSON TELEFON AB L M (SE)) 7 January 1999 (1999-01-07) abstract page 3, line 8 - line 32 page 10, line 18 -page 11, line 2 page 13, line 23 - line 25 claims 1,3,5,7	1,6,14, 19
A	US 5 781 431 A (PELAMOURGUES LIONEL ET AL) 14 July 1998 (1998-07-14) abstract column 5, line 57 - line 67 column 7, line 4 - line 25 claim 1	3,16
Y	WO 98 36542 A (KRAMPPELL MAGNUS ;TELIA AB (SE); JOHANSSON MAGNUS (SE)) 20 August 1998 (1998-08-20) abstract page 2, paragraph 2 -page 3, paragraph 7 page 5, line 18 -page 6, line 12	7-13, 20-26,28
Y	JOHNSON D: "PROVISIONING SERVICES" TELEPHONY,US,CHICAGO, IL, vol. 226, no. 22, 30 May 1994 (1994-05-30), pages 24-25, XP000606431 ISSN: 0040-2656 page 24, left-hand column, paragraph 3 page 25, left-hand column, paragraph 4	7-13, 20-26,28
A	EP 0 936 825 A (ALCATEL USA SOURCING LP) 18 August 1999 (1999-08-18) abstract column 3, paragraph 8 -column 4, paragraph 14 column 5, paragraph 25 column 7, paragraph 33 column 9, paragraph 41 column 7, line 33 - line 39	11-13, 24-26

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 00/03478

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-6, 14-19, 27

Apparatus, method and data network system requesting routing instructions to an external entity for special data packets

2. Claims: 7-13, 20-26, 28

Apparatus, method and data network system deciding services to be executed for received data packets

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. Patent Application No

PCT/EP 00/03478

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5745488	A	28-04-1998	AU 2671497 A WO 9741708 A	19-11-1997 06-11-1997
WO 9900737	A	07-01-1999	US 6128666 A EP 1019833 A	03-10-2000 19-07-2000
WO 9900946	A	07-01-1999	AU 7768398 A EP 0988733 A FI 981314 A NO 996454 A	19-01-1999 29-03-2000 26-12-1998 25-02-2000
US 5781431	A	14-07-1998	FR 2707775 A DE 69414934 D DE 69414934 T EP 0639013 A JP 7095197 A	20-01-1995 14-01-1999 01-07-1999 15-02-1995 07-04-1995
WO 9836542	A	20-08-1998	SE 511796 C SE 9700493 A	29-11-1999 14-08-1998
EP 0936825	A	18-08-1999	JP 11331956 A	30-11-1999

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PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

WRITTEN OPINION

(PCT Rule 66)

To:

LESON, Thomas J.A.
TIEDTKE-BÜHLING-KINNE & PARTNER
TBK-Patent
Bavariaring 4
D-80336 München
ALLEMAGNE

RECEIVED
EINGETRAGEN
16. Nov. 2001
TBK PATENT

Date of mailing
(day/month/year)

15.11.2001

Applicant's or agent's file reference

WO 26444

REPLY DUE

within 1 month(s)
from the above date of mailing

International application No.

PCT/EP00/03478

International filing date (day/month/year)

17/04/2000

Priority date (day/month/year)

13/09/1999

International Patent Classification (IPC) or both national classification and IPC

H04L12/56

Applicant

NOKIA NETWORKS OY et al.

1. This written opinion is the first drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain document cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.


If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 13/01/2002.

15.12.01 ✓

WVA.12. ✓

Name and mailing address of the international preliminary examining authority:

 European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Hamer, J

Formalities officer (incl. extension of time limits)

Barrio Baranano, A
Telephone No. +49 89 2399 8621



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WRITTEN OPINION

International application No. PCT/EP00/03478

I. Basis of the opinion

1. With regard to the **elements** of the international application (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"):

Description, pages:

1-16 as originally filed

Claims, No.:

1-13 as received on 29/10/2001 with letter of 29/10/2001

Drawings, sheets:

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

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☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation (Form PCT/IPEA/405) to restrict or pay additional fees, the applicant has:

☒ restricted the claims.

☐ paid additional fees.

☐ paid additional fees under protest.

☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with for the following reasons and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees:

3. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this opinion:

☒ all parts.

☐ the parts relating to claims Nos. .

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Claims 1,7

Inventive step (IS) Claims 1-13

Industrial applicability (IA) Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

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WRITTEN OPINION

International application No. PCT/EP00/03478

see separate sheet

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V- Reasoned Statement

1. The following documents are cited:

D1: US-A-5 745 488 (FELDMEIER DAVID C ET AL) 28 April 1998 (1998-04-28)
D2: WO 99 00737 A (SUN MICROSYSTEMS INC) 7 January 1999 (1999-01-07)
D3: WO 99 00946 A (ARKKO JARI ;ERICSSON TELEFON AB L M (SE)) 7
January 1999 (1999-01-07)
D4: US-A-5 781 431 (PELAMOURGUES LIONEL ET AL) 14 July 1998 (1998-
07-14)

2. The subject-matter of claim 1 of the present invention is concerned with an apparatus for receiving a plurality of data packets and for routing the packets in a data network. According to the description, the rules for routing packets are fixed and difficult to change. Thus to deal with special packets which require special routing would involve a lot of overhead. Claim 1 proposes to solve this problem by storing in a storing means a pre-defined list of rules for detecting and routing special packets on the basis of these stored rules.

Document D1 solves the same problem using the same features. From D1, col 4, lines 9 to 35, it can be seen that the system includes a RAM memory which stores cell types which can be compared with incoming cells to detect their cell types. This information is then used to provide appropriate routing.

Col. 7, lines 1 to 20 gives some examples of cell types and their processing. Each of these cell types (e.g. signalling, OAM etc.) is a special type. From this section it can be seen that the memory which contains the routing information corresponding to a particular cell type can be a dynamically programmable one.

Thus, D1 appears to contain all the features of claim 1 and claim 1 is therefore not new, contrary to the requirements of Article 3(2) PCT.

3. Even if claim 1 were to be modified slightly to achieve novelty with regard to D1, the claim would still not involve an inventive step as all the features of this claim are already known. It is also noted that D2 (see passages cited in the international

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search report) contains all the features of claim 1. In D2 (see claim 1 of D2), a list of rules is stored in a database along with packet types. Incoming packets are analysed to determine their type and then routed accordingly. Thus also with regard to D2, claim 1 does not involve an inventive step and does not meet the requirements of Article 33(3) PCT. D3 also involves similar material. In this system the packets are assigned a cost class which is analysed to provide routing.

4. The subject-matter of independent claim 7 is essentially the same as that of claim 1, but expressed in terms of method features. Thus for the same reasons outlined above, claim 7 also does not meet the requirements of Articles 33(2) and (3) PCT.
5. Dependent claims 2 to 6 and 8 to 13 are not appended to an independent claim which meets the requirements of Article 33(3) PCT. Furthermore, their subject-matter does not appear to contain anything of inventive significance which added to that of claim 1 would provide an inventive step. No features are disclosed which are not either already known from the prior art documents listed above or which are not obvious to a person skilled in the art of data networks. Claim 13 is considered to be a dependent claim as it contains all the features of a previous claim.

VII- Certain Defects

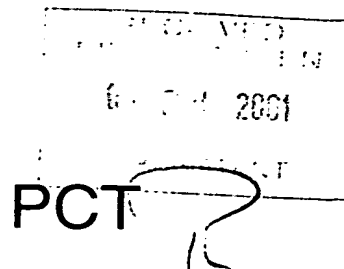
The following deficiencies are found in the application:

- b) The independent claims do not meet the requirements of Rule 6.3(b) PCT in that they are not divided into the two-part form.
- c) The most relevant of the documents cited in the International Search Report should be referenced and briefly discussed in the description, Rule 5.1(a)(ii), PCT.
- d) The description should be modified to bring it into agreement with any modified independent claim, Rule 5.1(a)(iii), PCT. This includes the removal of any subject-matter dealing with the second invention, the claims of which have now been removed.

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PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY



To:

LESON, Thomas J.A.
TIEDTKE-BÜHLING-KINNE & PARTNER
TBK-Patent
Bavariaring 4
D-80336 München
ALLEMAGNE

INVITATION TO RESTRICT OR
TO PAY ADDITIONAL FEES

(PCT Article 34(3) (a) and Rule 68.2)

Date of mailing (Day/month/year) 01.10.2001	
Applicant's or agent's file reference WO 26444	REPLY OR PAYMENT DUE within 1 month(s) from the above date of mailing
International application No. PCT/EP00/03478	International filing date (day/month/year) 17/04/2000
Priority date (day/month/year) 13/09/1999	
International Patent classification (IPC) or national Patent classification: H04L12/56	
Applicant NOKIA NETWORKS OY et al.	

1. This International Examining Authority

- (i) considers that **the international application does not comply with the requirements of unity of invention** (Rule 13.1, 13.2 and 13.3) for the reasons indicated in the Annex.
- (ii) therefore considers that there are **2 inventions** claimed in the international application as indicated in the Annex.
- (iii) recalls that claims relating to inventions in respect of which no international search report has been established need not be the subject of international preliminary examination (Rule 66.1 (e)).

2. Consequently the applicant is hereby **invited**, within the time limit indicated above, **to restrict the claims** as suggested under item 3, below, **or to pay** the amount indicated below:

$$\frac{\text{eur 1533.00}}{\text{Fee per additional invention}} \times \frac{001}{\text{number of additional inventions}} = \frac{\text{eur 1533.00}}{\text{total amount of additional fees}}$$

The applicant is informed that, according to Rule 68.3 (c), **the payment of any additional fee may be made under protest**, i.e. a reasoned statement to the effect that the international application complies with the requirement of unity of invention or that the amount of the required additional fee is excessive.

- 3. **If the applicant opts to restrict the claims**, this Authority suggests the restriction possibilities indicated in the Annex, which in its opinion would be in compliance with the requirement of unity of invention.
- 4. **In the absence of any response** from the applicant, this Authority will establish the international preliminary examination report on those parts of the international application indicated in the Annex which, in the opinion of this Authority appear to relate to the main invention.

Att: 1. 11. 01
T: 20.10.

Name and mailing address of the
international preliminary examination authority:

European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer

Hamer, J

Telephone No. +49 89 2399-8827



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**INVITATION TO RESTRICT
OR TO PAY ADDITIONAL FEES**

International application No. PCT/EP00/03478

1. The examiner agrees with the opinion of the search authority that the subject-matter of the claims of the present application is not linked by a single inventive concept (Rule 13.1, PCT).

The two groups of inventions are the following:

Invention I: Claims 1-6, 14-19 and 27; Apparatus, method and data network system requesting routing instructions to an external entity for special data packets.

Invention II: Claims 7-13, 20-26 and 28; Apparatus, method and data network system deciding services to be executed for received data packets.

These two inventions could be implemented independently of each other and share neither an inventive concept (Rule 13.1, PCT), nor special technical features (Rule 13.2, PCT).

In view of the above, the Applicant may wish to restrict the claims. As all the claims have been searched, if they were restricted to those dealing with any single one of the above identified inventions/groups of inventions, they would then comply with the requirements of unity of invention.

Alternatively, as a full preliminary search report has been established, a full preliminary examination may also be conducted, providing that additional preliminary examination fees are paid (see Form 405) (Article 34(3)(a), Rule 68(2) PCT).

In filing a new set of claims, the Applicant is asked to point out specifically how the requirements of Rules 13.1 and 13.2 PCT are fulfilled, should more than one independent claim be filed. Furthermore, the support by the description (Art. 6 PCT) should be demonstrated in order to avoid an objection based on Art. 34 (2)(b) PCT (extension beyond the content of the application as originally filed). If the Applicant does not respond to the invitation to restrict the claims or pay additional fees, the preliminary examination report will be established on those parts of the international application appearing to be the main invention, namely invention I (Article 34(3)(c), PCT).

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**INVITATION TO RESTRICT
OR TO PAY ADDITIONAL FEES**

International application No. PCT/EP00/03478

2. The following deficiencies are also found in the application:
- a) The independent claims do not meet the requirements of Rule 6.3(b) PCT in that they are not divided into the two-part form.
 - b) The most relevant of the documents cited in the International Search Report should be referenced and briefly discussed in the description, Rule 5.1(a)(ii), PCT.
 - c) The description should be modified to bring it into agreement with any modified independent claim, Rule 5.1(a)(iii), PCT.

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PCT

NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühling-Kinne
Bavariaring 4
D-80336 Munich
ALLEMAGNEEINGEGANGEN
Patentanwälte
- 2. April 2001
TIEDTKE · BÜHLING · KINNE
& PARTNER (GbR)

Date of mailing (day/month/year) 22 March 2001 (22.03.01)		
Applicant's or agent's file reference WO26444		
IMPORTANT NOTICE		
International application No. PCT/EP00/03478	International filing date (day/month/year) 17 April 2000 (17.04.00)	Priority date (day/month/year) 13 September 1999 (13.09.99)
Applicant NOKIA NETWORKS OY et al		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
AU,KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE,AG,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CN,CR,CU,CZ,DE,DK,DM,DZ,EA,EE,EP,ES,FI,
GB,GD,GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MN,
MW,MX,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
22 March 2001 (22.03.01) under No. WO 01/20856

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer J. Zahra Telephone No. (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference W026444	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 00/ 03478	International filing date (day/month/year) 17/04/2000	(Earliest) Priority Date (day/month/year)
Applicant NOKIA NETWORKS OY		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

INTELLIGENT DATA NETWORK ROUTER

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1
☐ None of the figures.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 00/03478

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

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FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-6, 14-19, 27

Apparatus, method and data network system requesting routing instructions to an external entity for special data packets

2. Claims: 7-13, 20-26, 28

Apparatus, method and data network system deciding services to be executed for received data packets

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INTERNATIONAL SEARCH REPORT

International Application No

CT/EP 00/03478

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L12/56 H04L29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 745 488 A (FELDMEIER DAVID C ET AL) 28 April 1998 (1998-04-28) abstract column 3, line 65 -column 4, line 35	1,2,14, 15,27
A	column 7, line 1 - line 20 claim 1; figure 5 ---	3,4,16, 17
X	WO 99 00737 A (SUN MICROSYSTEMS INC) 7 January 1999 (1999-01-07) abstract claims 1,2,33; figure 3 --- -/--	1,5,14, 18

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

* & * document member of the same patent family

Date of the actual completion of the international search

11 July 2001

Date of mailing of the international search report

30. 07. 2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Blanco Cardona, P

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/03478

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 00946 A (ARKKO JARI ;ERICSSON TELEFON AB L M (SE)) 7 January 1999 (1999-01-07) abstract page 3, line 8 - line 32 page 10, line 18 -page 11, line 2 page 13, line 23 - line 25 claims 1,3,5,7 ----	1,6,14, 19
A	US 5 781 431 A (PELAMOURGUES LIONEL ET AL) 14 July 1998 (1998-07-14) abstract column 5, line 57 - line 67 column 7, line 4 - line 25 claim 1 ----	3,16
Y	WO 98 36542 A (KRAMPPELL MAGNUS ;TELIA AB (SE); JOHANSSON MAGNUS (SE)) 20 August 1998 (1998-08-20) abstract page 2, paragraph 2 -page 3, paragraph 7 page 5, line 18 -page 6, line 12 ----	7-13, 20-26,28
Y	JOHNSON D: "PROVISIONING SERVICES" TELEPHONY,US,CHICAGO, IL, vol. 226, no. 22, 30 May 1994 (1994-05-30), pages 24-25, XP000606431 ISSN: 0040-2656 page 24, left-hand column, paragraph 3 page 25, left-hand column, paragraph 4 ----	7-13, 20-26,28
A	EP 0 936 825 A (ALCATEL USA SOURCING LP) 18 August 1999 (1999-08-18) abstract column 3, paragraph 8 -column 4, paragraph 14 column 5, paragraph 25 column 7, paragraph 33 column 9, paragraph 41 column 7, line 33 - line 39 -----	11-13, 24-26

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/03478

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5745488	A	28-04-1998	AU 2671497 A WO 9741708 A	19-11-1997 06-11-1997
WO 9900737	A	07-01-1999	US 6128666 A EP 1019833 A	03-10-2000 19-07-2000
WO 9900946	A	07-01-1999	AU 7768398 A EP 0988733 A FI 981314 A NO 996454 A	19-01-1999 29-03-2000 26-12-1998 25-02-2000
US 5781431	A	14-07-1998	FR 2707775 A DE 69414934 D DE 69414934 T EP 0639013 A JP 7095197 A	20-01-1995 14-01-1999 01-07-1999 15-02-1995 07-04-1995
WO 9836542	A	20-08-1998	SE 511796 C SE 9700493 A	29-11-1999 14-08-1998
EP 0936825	A	18-08-1999	JP 11331956 A	30-11-1999

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(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
22 March 2001 (22.03.2001)

PCT

(10) International Publication Number
WO 01/20856 A2

(51) International Patent Classification⁷: **H04L 12/56**

(21) International Application Number: **PCT/EP00/03478**

(22) International Filing Date: **17 April 2000 (17.04.2000)**

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
PCT/EP99/06759
13 September 1999 (13.09.1999) EP

(71) Applicant (for all designated States except US): **NOKIA NETWORKS OY [FI/FI]; Keilalahdentie 4, FIN-02150 Espoo (FI).**

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BERGENWALL,**

Martin [FI/FI]; Heinjoenpolku 3 A 6, FIN-02140 Espoo (FI). SIVALINGAM, Kengatharan [FI/FI]; Ulivilantie 8 C 34, FIN-00350 Helsinki (FI). USKELA, Sami [FI/FI]; Siltasaarenkatu 26 A 1, FIN-00530 Helsinki (FI).

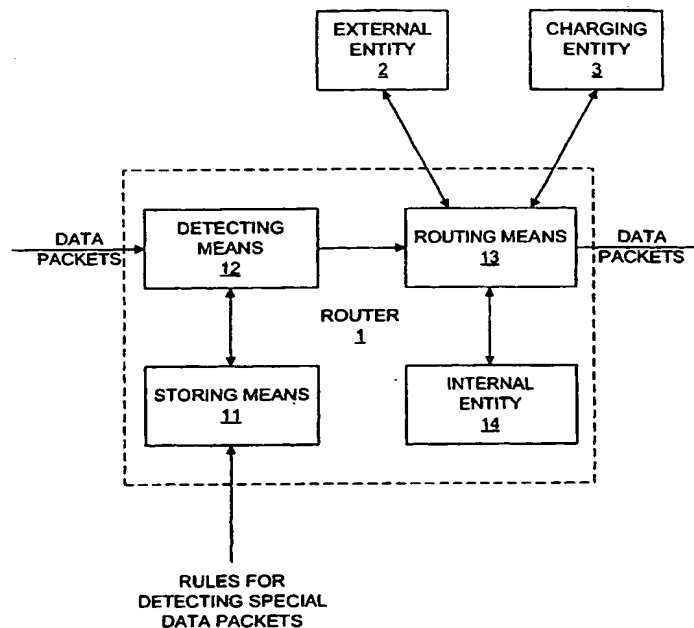
(74) Agents: **PELLMANN, Hans-Bernd et al.; Tiedtke-Bühling-Kinne, Bavariaring 4, D-80336 Munich (DE).**

(81) Designated States (national): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.**

(84) Designated States (regional): **ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU,**

[Continued on next page]

(54) Title: **ADVANCED SERVICE ARCHITECTURE FOR NEXT GENERATION NETWORK SERVICES AND INTELLIGENT DATA NETWORK ROUTER**



(57) Abstract: According to the present invention, a plurality of data packets are received and routed by a router (1) in a data network. The router (1) comprises storing means (11) for storing a pre-defined list of rules for detecting special data packets, detecting means (12) for detecting special data packets in the received plurality of data packets on the basis of the pre-defined list of rules stored in said storing means (11), and routing means (13) for requesting instructions for the special data packets

[Continued on next page]

WO 01/20856 A2

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MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *Without international search report and to be republished upon receipt of that report.*

detected by said detecting means (12) and for routing the special data packets in accordance with instructions received on request. According to the present invention, an advanced service architecture for next generation network services is provided. In this service architecture, the functions of the detecting means (12) and the routing means (13) can be achieved by a service trigger and a service logic, respectively.

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PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühlring-Kinne
Bavariaring 4
D-80336 Munich
ALLEMAGNE

RECEIVED
EINGEGANGEN
25. Jan. 2002
TBK - PATENT

Date of mailing (day/month/year) 10 January 2002 (10.01.02)	
Applicant's or agent's file reference WO26444	IMPORTANT NOTIFICATION
International application No. PCT/EP00/03478	International filing date (day/month/year) 17 April 2000 (17.04.00)

1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

Name and Address NOKIA NETWORKS OY Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No. +358 9 1807 0	
	Facsimile No. +358 9 1807 496	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☒ the name ☐ the address ☐ the nationality ☐ the residence

Name and Address NOKIA CORPORATION Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No. +358 9 1807 0	
	Facsimile No. +358 9 1807 496	
	Teleprinter No.	

3. Further observations, if necessary:

Change of applicant's name (merger) has been recorded.

4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned
☐ the International Searching Authority ☒ the elected Offices concerned
☒ the International Preliminary Examining Authority ☐ other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer R. Chrem Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

INFORMATION CONCERNING ELECTED
OFFICES NOTIFIED OF THEIR ELECTION

(PCT Rule 61.3)

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühling-Kinne
Bavariaring 4
D-80336 Munich
ALLEMAGNERECEIVED
EINGEGANGEN

- 2 Juli 2001

TBK - PATENT

Date of mailing (day/month/year) 20 June 2001 (20.06.01)		
Applicant's or agent's file reference WO26444		
IMPORTANT INFORMATION		
International application No. PCT/EP00/03478	International filing date (day/month/year) 17 April 2000 (17.04.00)	Priority date (day/month/year) 13 September 1999 (13.09.99)
Applicant NOKIA NETWORKS OY et al		

1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

EP : AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

National : AU, BG, CA, CN, CZ, DE, IL, JP, KP, KR, MN, NO, NZ, PL, RO, RU, SE, SK, US

2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

AP : GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW

EA : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

OA : BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

National : AE, AG, AL, AM, AT, AZ, BA, BB, BR, BY, CH, CR, CU, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IN, IS, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MW, MX, PT, SD, SG, SI, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW

3. The applicant is reminded that he must enter the "national phase" before the expiration of 30 months from the priority date before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing, if prescribed, a translation of the international application (Article 39(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 36(3)(b) and Rule 74.1).

Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

The entry into the European regional phase is postponed until 31 months from the priority date for all States designated for the purposes of obtaining a European patent.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer: Juan Cruz
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

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PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühling-Kinne et al
Bavariaring 4
D-80336 Munich
ALLEMAGNE

NOTIFICATION OF RECEIPT OF
RECORD COPY

(PCT Rule 24.2(a))

Date of mailing (day/month/year) 06 June 2000 (06.06.00)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference WO26444	International application No. PCT/EP00/03478

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

NOKIA NETWORKS OY (for all designated States except US)
BERGENWALL, Martin et al (for US)

International filing date : 17 April 2000 (17.04.00)
Priority date(s) claimed : 13 September 1999 (13.09.99)
Date of receipt of the record copy
by the International Bureau : 17 May 2000 (17.05.00)
List of designated Offices :

AP : GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW
EA : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
EP : AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE
OA : BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
National : AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES,
FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN,
YU, ZA, ZW

ATTENTION

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex, relating to:

- ☒ time limits for entry into the national phase
☐ confirmation of precautionary designations
☒ requirements regarding priority documents

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer: Peggy Steunenbergh Telephone No. (41-22) 338.83.38
--	--

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INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated in the Notification of Receipt of Record Copy (Form PCT/IB/301) by paying national fees and furnishing translations, as prescribed by the applicable national laws.

The time limit for performing these procedural acts is **20 MONTHS** from the priority date or, for those designated States which the applicant elects in a demand for international preliminary examination or in a later election, **30 MONTHS** from the priority date, provided that the election is made before the expiration of 19 months from the priority date. Some designated (or elected) Offices have fixed time limits which expire even later than 20 or 30 months from the priority date. In other Offices an extension of time or grace period, in some cases upon payment of an additional fee, is available.

In addition to these procedural acts, the applicant may also have to comply with other special requirements applicable in certain Offices. It is the applicant's responsibility to ensure that the necessary steps to enter the national phase are taken in a timely fashion. Most designated Offices do not issue reminders to applicants in connection with the entry into the national phase.

For detailed information about the procedural acts to be performed to enter the national phase before each designated Office, the applicable time limits and possible extensions of time or grace periods, and any other requirements, see the relevant Chapters of Volume II of the PCT Applicant's Guide. Information about the requirements for filing a demand for international preliminary examination is set out in Chapter IX of Volume I of the PCT Applicant's Guide.

GR and ES became bound by PCT Chapter II on 7 September 1996 and 6 September 1997, respectively, and may, therefore, be elected in a demand or a later election filed on or after 7 September 1996 and 6 September 1997, respectively, regardless of the filing date of the international application. (See second paragraph above.)

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

CONFIRMATION OF PRECAUTIONARY DESIGNATIONS

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations may be confirmed according to Rule 4.9(c) before the expiration of 15 months from the priority date. If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with an indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.

REQUIREMENTS REGARDING PRIORITY DOCUMENTS

For applicants who have not yet complied with the requirements regarding priority documents, the following is recalled.

Where the priority of an earlier national, regional or international application is claimed, the applicant must submit a copy of the said earlier application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date, provided that any such priority document may still be submitted to the International Bureau before that date of international publication of the international application, in which case that document will be considered to have been received by the International Bureau on the last day of the 16-month time limit (Rule 17.1(a)).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such request must be made before the expiration of the 16-month time limit and may be subjected by the receiving Office to the payment of a fee (Rule 17.1(b)).

If the priority document concerned is not submitted to the International Bureau or if the request to the receiving Office to prepare and transmit the priority document has not been made (and the corresponding fee, if any, paid) within the applicable time limit indicated under the preceding paragraphs, any designated State may disregard the priority claim, provided that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity to furnish the priority document within a time limit which is reasonable under the circumstances.

Where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

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PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

RECEIVED
EINZELN

28. Dec 2001

PCT PATENT

To:

LESON, Thomas J.A.
TIEDTKE-BÜHLING-KINNE & PARTNER
TBK-Patent
Bavariaring 4
D-80336 München
ALLEMAGNE

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing
(day/month/year) 27.12.2001

Applicant's or agent's file reference
WO 26444

IMPORTANT NOTIFICATION

International application No.
PCT/EP00/03478

International filing date (day/month/year)
17/04/2000

Priority date (day/month/year)
13/09/1999

Applicant
NOKIA NETWORKS OY et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/

 European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer

Barrio Baranano, A

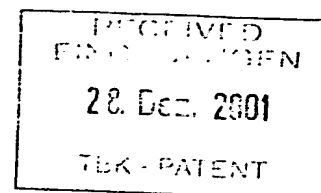
Tel. +49 89 2399-8621



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PATENT COOPERATION TREATY

PCT



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference WO 26444	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/03478	International filing date (<i>day/month/year</i>) 17/04/2000	Priority date (<i>day/month/year</i>) 13/09/1999
International Patent Classification (IPC) or national classification and IPC H04L12/56		
Applicant NOKIA NETWORKS OY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 12/04/2001	Date of completion of this report 27.12.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Hamer, J Telephone No. +49 89 2399 8827 <div style="text-align: right;"> </div>

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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/03478

I. Basis of the report

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-16 as originally filed

Claims, No.:

1-11 as received on 06/12/2001 with letter of 06/12/2001

Drawings, sheets:

1/4-4/4 as originally filed

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:

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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/03478

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☒ restricted the claims.
☐ paid additional fees.
☐ paid additional fees under protest.
☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
☐ the parts relating to claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-11
	No: Claims
Inventive step (IS)	Yes: Claims
	No: Claims 1-11

International application No. PCT/EP00/03478

**The following defects in the form or contents of the international application have been noted:
see separate sheet**

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V- Reasoned Statement

1. The following documents are cited:

D1: US-A-5 745 488 (FELDMEIER DAVID C ET AL) 28 April 1998 (1998-04-28)
D2: WO 99 00737 A (SUN MICROSYSTEMS INC) 7 January 1999 (1999-01-07)
D3: WO 99 00946 A (ARKKO JARI ;ERICSSON TELEFON AB L M (SE)) 7
January 1999 (1999-01-07)
D4: US-A-5 781 431 (PELAMOURGUES LIONEL ET AL) 14 July 1998 (1998-
07-14)

2. The subject-matter of claim 1 of the present invention is concerned with an apparatus for receiving a plurality of data packets and for routing the packets in a data network. According to the description, the rules for routing packets are fixed and difficult to change. Thus to deal with special packets which require special routing would involve a lot of overhead. Claim 1 proposes to solve this problem by storing in a storing means a pre-defined list of rules for detecting and routing special packets on the basis of these stored rules. The rules themselves are stored in an internal entity. The router is supplied with routing information from this internal entity. An external entity can update the routing instructions stored in the internal entity.

Document D1 solves the same problem using the same features. From D1, col 4, lines 9 to 35, it can be seen that the system includes a RAM memory which stores cell types which can be compared with incoming cells to detect their cell types. This information is then used to provide appropriate routing. This section corresponds to the preamble of claim 1.

Col. 7, lines 1 to 20 gives some examples of cell types and their processing. Each of these cell types (e.g. signalling, OAM etc.) is a special type. From this section it can be seen that the memory which contains the routing information corresponding to a particular cell type can be a dynamically programmable one. This memory corresponds to the internal entity of claim 1.

From col. 4, lines 29 to 32, it can be seen that the routing controller of D1

corresponds to the routing means of present claim 1. As in claim 1, the routing controller of D1 receives routing instructions from the internal entity or memory.

From col. 7, lines 17 to 20, it can be seen that the routing controller (=internal entity) is dynamically reprogrammable. This means that like in claim 1, it can be updated.

Thus the only difference between the disclosure of D1 and that of claim 1 is that D1 does not mention where the new instructions for the routing controller (=internal entity) come from, whereas in claim 1 they come from an external entity.

This single feature does not involve an inventive step. The updating entity must be located somewhere, but for a skilled person, the location of such an entity internally or externally is a trivial choice. The claim makes no mention as to how or by what route the updating information arrives. This feature is only concerned with the location of a store. No surprising or inventive effect ensues by its location internally or externally.

Thus, claim 1 does not involve an inventive step and claim 1 does not meet the requirements of Article 33(3) PCT.

3. The subject-matter of independent claim 6 is essentially the same as that of claim 1, but expressed in terms of method features. Thus for the same reasons outlined above, claim 6 also does not meet the requirements of Article 33(3) PCT.
4. Dependent claims 2 to 5 and 11, and 7 to 10 are not appended to an independent claim which meets the requirements of Article 33(3) PCT. Furthermore, their subject-matter does not appear to contain anything of inventive significance which added to that of claim 1 would provide an inventive step. No features are disclosed which are not either already known from the prior art documents listed above or which are not obvious to a person skilled in the art of data networks. Claim 11 is considered to be a dependent claim as it contains all the features of a previous claim.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/03478

VII- Certain Defects

The following deficiencies are found in the application:

- b) The independent claims do not meet the requirements of Rule 6.3(b) PCT in that they are not divided into the two-part form.
- c) The most relevant of the documents cited in the International Search Report (see above) should have been referenced and briefly discussed in the description, Rule 5.1(a)(ii), PCT.
- d) The description should have been modified to bring it into agreement with the modified independent claims, Rule 5.1(a)(iii), PCT. This includes the removal of any subject-matter dealing with the second invention, the claims of which have now been removed.

PCT REQUEST

WO26444

Original (for SUBMISSION) - printed on 17.04.2000 10:50:28 AM

0	For receiving Office use only	
0-1	International Application No.	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application"	
0-4	Form - PCT/RO/101 PCT Request Prepared using	PCT-EASY Version 2.90 (updated 08.03.2000)
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	European Patent Office (EPO) (RO/EP)
0-7	Applicant's or agent's file reference	WO26444
I	Title of invention	ADVANCED SERVICE ARCHITECTURE FOR NEXT GENERATION NETWORK SERVICES AND INTELLIGENT DATA NETWORK ROUTER
II	Applicant	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States except US
II-4	Name	NOKIA NETWORKS OY
II-5	Address:	Keilalahdentie 4 FIN-02150 Espoo Finland
II-6	State of nationality	FI
II-7	State of residence	FI
II-8	Telephone No.	+358 9 1807 0
II-9	Facsimile No.	+358 9 1807 496
III-1	Applicant and/or inventor	
III-1-1	This person is:	applicant and inventor
III-1-2	Applicant for	US only
III-1-4	Name (LAST, First)	BERGENWALL, Martin
III-1-5	Address:	Heinjoenpolku 3 A 6 FIN-02140 Espoo Finland
III-1-6	State of nationality	FI
III-1-7	State of residence	FI

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WO26444

III-2	Applicant and/or inventor	
III-2-1	This person is:	applicant and inventor
III-2-2	Applicant for	US only
III-2-4	Name (LAST, First)	SIVALINGAM, Kengatharan
III-2-5	Address:	Ulivilantie 8 C 34 FIN-00350 Helsinki Finland
III-2-6	State of nationality	FI
III-2-7	State of residence	FI
III-3	Applicant and/or inventor	
III-3-1	This person is:	applicant and inventor
III-3-2	Applicant for	US only
III-3-4	Name (LAST, First)	USKELA, Sami
III-3-5	Address:	Siltasaarenkatu 26 A 1 FIN-00530 Helsinki Finland
III-3-6	State of nationality	FI
III-3-7	State of residence	FI
IV-1	Agent or common representative; or address for correspondence The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name (LAST, First)	PELLMANN, Hans-Bernd
IV-1-2	Address:	Tiedtke-Bühling-Kinne et al Bavariaring 4 D-80336 Munich Germany
IV-1-3	Telephone No.	+49 89 544690
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IV-1-5	e-mail	postoffice@tbk-patent.de
IV-2	Additional agent(s)	additional agent(s) with same address as first named agent
IV-2-1	Name(s)	TIEDTKE, Harro; BÜHLING, Gerhard; KINNE, Reinhard; GRAMS, Klaus; VOLLNHALS, Aurel; LESON, Thomas, Johannes, Alois; TRÖSCH, Hans-Ludwig; CHIVAROV, Georgi; GRILL, Matthias; KÜHN, Alexander; OSER, Andreas; BÖCKELEN, Rainer

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V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	<p>AP: GH GM KE LS MW SD SL SZ TZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT</p> <p>EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT</p> <p>EP: AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE and any other State which is a Contracting State of the European Patent Convention and of the PCT</p> <p>OA: BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT</p>
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	<p>AE AG AL AM AT AU AZ BA BB BG BR BY CA CH&LI CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW</p>
V-5	Precautionary Designation Statement In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.	
V-6	Exclusion(s) from precautionary designations	NONE
VI-1	Priority claim of earlier international application	
VI-1-1	Filing date	13 September 1999 (13.09.1999)
VI-1-2	Number	PCT/EP99/06759
VI-1-3	PCT receiving Office	EP
VII-1	International Searching Authority Chosen	European Patent Office (EPO) (ISA/EP)

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VIII	Check list	number of sheets	electronic file(s) attached
VIII-1	Request	4	-
VIII-2	Description	16	-
VIII-3	Claims	5	-
VIII-4	Abstract	1	wo26444.txt
VIII-5	Drawings	4	-
VIII-7	TOTAL	30	
	Accompanying Items	paper document(s) attached	electronic file(s) attached
VIII-8	Fee calculation sheet	✓	-
VIII-16	PCT-EASY diskette	-	diskette
VIII-18	Figure of the drawings which should accompany the abstract	1	
VIII-19	Language of filing of the International application	English	
IX-1	Signature of applicant or agent		
IX-1-1	Name (LAST, First)	PELLMANN, Hans-Bernd	

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
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PCT (ANNEX - FEE CALCULATION SHEET)

WO26444

Original (for SUBMISSION) - printed on 17.04.2000 10:50:28 AM

(This sheet is not part of and does not count as a sheet of the international application)

0	For receiving Office use only	
0-1	International Application No.	
0-2	Date stamp of the receiving Office	
0-4	Form - PCT/RO/101 (Annex)	
0-4-1	PCT Fee Calculation Sheet Prepared using	PCT-EASY Version 2.90 (updated 08.03.2000)
0-9	Applicant's or agent's file reference	WO26444
2	Applicant	NOKIA NETWORKS OY, et al.
12	Calculation of prescribed fees	fee amount/multiplier total amounts (EUR)
12-1	Transmittal fee T	⇒ 102
12-2	Search fee S	⇒ 945
12-3	International fee	
	Basic fee (first 30 sheets) b1	409
12-4	Remaining sheets	0
12-5	Additional amount (X) 9	
12-6	Total additional amount b2	0
12-7	b1 + b2 = B	409
12-8	Designation fees	
	Number of designations contained in international application	85
12-9	Number of designation fees payable (maximum 8)	8
12-10	Amount of designation fee (X) 88	
12-11	Total designation fees D	704
12-12	PCT-EASY fee reduction R	-126
12-13	Total International fee (B+D-R) I	⇒ 987
12-17	TOTAL FEES PAYABLE (T+S+H+P)	⇒ 2.034
12-19	Mode of payment	authorization to charge deposit account
12-20	Deposit account instructions	
	The receiving Office:	European Patent Office (EPO) (RO/EP)
12-20-1	is hereby authorized to charge the total fees indicated above to my deposit account	✓
12-20-2	is hereby authorized to charge any deficiency or credit any over-payment in the total fees indicated above to my deposit account	✓
12-20-3	is hereby authorized to charge the fee for preparation and transmittal of the priority document to the International Bureau of WIPO to my deposit account	✓
12-21	Deposit account No.	28 000 428
12-22	Date	17 April 2000 (17.04.2000)

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PCT (ANNEX - FEE CALCULATION SHEET)

WO26444

Original (for SUBMISSION) - printed on 17.04.2000 10:50:28 AM

12-23	Name and signature	PELLMANN, Hans-Bernd
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VALIDATION LOG AND REMARKS

13-2-1	Validation messages Request	Green? The title of the invention shall be short and precise. Please verify.
13-2-6	Validation messages Contents	Yellow! The power of attorney or a copy of the general power of attorney will need to be furnished unless all applicants sign the request form.
		Green? Priority 1. The priority document is not enclosed. (The applicant must furnish it within 16 months from the earliest priority date claimed)
13-2-8	Validation messages Payment	Green? Please ensure that you have a valid deposit account with the receiving Office selected.

TBK-Patent POB 20 19 18 80019 München

An das
Europäische Patentamt

80298 München

Patentanwälte
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Dipl.-Ing. Dr. Georgi Chivarov
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Dipl.-Ing. Hans-Ludwig Trösch
Dipl.-Ing. Alexander Kühn
Dipl.-Ing. Rainer Böckelen
Dipl.-Ing. Stefan Klingele
Dipl.-Chem. Stefan Bühling
Dipl.-Ing. Ronald Roth

December 6, 2001

PCT Chapter II

PCT Patent Application No.: PCT/EP00/03478

NOKIA NETWORKS OY

Our ref.: WO 26444

(F15.12., Eing.)

Reference is made to the Written Opinion of November 15, 2001.

Enclosed new claims 1 to 11 replacing the hitherto valid claim version are filed upon which the further prosecution of the application is based.

The new claim 1 includes the features of the hitherto valid claims 1 and 2 and part of the features of the hitherto valid claim 4, and, correspondingly, the new independent method claim 6 includes the features of the hitherto valid claims 7 and 8 and part of the features of the hitherto valid claim 10.

Moreover, the new independent claims are delimited against the disclosure of document D1 so that the incorporated features of the hitherto valid claims 2 and 4 (or claims 8 and 10) form the characterizing part.

Dresdner Bank	München	Kto. 3939 844	BLZ 700 800 00
Deutsche Bank	München	Kto. 286 1060	BLZ 700 700 10
Postbank	München	Kto. 67043 804	BLZ 700 100 80
Dai-ichi Kangyo Bank	Düsseldorf	Kto. 8104233007	BLZ 300 207 00
Sanwa Bank	Düsseldorf	Kto. 500 047	BLZ 301 307 00

/S

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It is intended to postpone the revision and adaptation of the specification to the new claims until entering the respective national/regional phase.

With respect to the cited prior art, in document D1 a detection of the packet type of information packets received at a node in a packet based communications network is disclosed. The detection is accomplished by comparing information from each received packet to a table of possible packet types. After packet type identification the corresponding packet is routed for processing based on type. A content addressable memory CAM may be utilized to store the table information and to perform the required comparisons. Each entry in the CAM table may have an associated memory address that is identified whenever an input data word matches the corresponding entry. Also associated with each of the entries in the CAM table is a data record in a RAM array, which contains cell type information corresponding to the entry. Each data record is referred to as a code point and may include information relating to the processing and priority of a received cell.

Furthermore, in document D2 a system is described which includes an input port process IPP that buffers the input packet received and forwards header information to the search engine. The search engine searches a database maintained on the switch element to determine the type of the packet. The type may indicate whether the packet can be routed in hardware. The search engine sends the packet type information to the IPP along with the destination address to be updated if the packet is to be routed. An output port process OPP reads a modified input packet and control field information, selectively performs additional modifications to the modified input packet and issues control signals to an output interface.

Moreover, document D3 is concerned with the collection of charging information relating to the usage of a packet-switched data network by a network user. According to document D3, in a router of the network a routing table is constructed which contains a set of destination address ranges and a set of respective next hop network nodes. To each address range in the routing table a cost class is assigned in dependence upon links/nodes, and respective cost classes are assigned through which a packet must travel to an address within the range. When a data packet is received from the network user, its destination address is defined and, on the basis of the destination address, the associated cost class is determined from the routing table, and then a corresponding cost class counter is incremented.

Finally, document D4 relates to a process for analysis of information contained in a data sequence to supply routing information to a network node for routing the data sequence either across a network or to an external system for additional processing.

According to the present invention, the prior art problem which is to be overcome is that propagation of data packets in the network is slow and a dynamic update of routers is not easy since all routers must know the handling of all packets and if the handling for one user changes all routing tables in all routers must be updated.

According to the present invention this problem is solved by determining and updating instructions for data packets by means of an entity which is provided externally from the router.

In contrast thereto, the cited prior art documents do not show such a "centralized" determining or updating mechanism.

The new independent claims are amended in such a way that it becomes clearer therefrom that the instructions for the special data packets do not reside in the router itself but are requested from an internal entity wherein an external entity is arranged to determine and update the instructions stored in the internal entity during active operations.

In view of the above the subject matter of the new claim version is new and also involves an inventive step in comparison with the cited prior art. Hence, the Examiner is respectfully requested to reconsider the present case on the basis of the new claims 1 to 11 in connection with the above discussion of the prior art.

H.-B. Pellmann
Patentanwalt
TBK-Patent

Enclosures:

- New claims 1 to 11 in triplicate

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Enclosure of December 6, 2001

PCT Patent Application No.: PCT/EP00/03478

NOKIA NETWORKS OY

Our ref.: WO 26444

New claims 1 to 11

1. An apparatus (1) for receiving a plurality of data packets and for routing the data packets in a data network, comprising:

storing means (11) for storing a pre-defined list of rules for detecting special data packets;

detecting means (12) for detecting special data packets in the received plurality of data packets on the basis of the pre-defined list of rules stored in said storing means (11); and

routing means (13) for requesting instructions for the special data packets detected by said detecting means (12) and for routing the special data packets in accordance with instructions received on request,

characterized by:

an internal entity (14) for storing instructions for the special data packets,

wherein said routing means (13) is arranged to notify said internal entity (14) of the detected special data packets and request instructions for the special data packets from said internal entity (14), and

wherein an external entity (2) is arranged to determine and update the instructions stored in said internal entity (14) during active operations.

2. The apparatus according to claim 1, wherein said routing means (13) is arranged to notify the external entity (2) of the detected special data packets and request instructions for the special data packets from said external entity (2).

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3. The apparatus according to claim 1, wherein said external entity is arranged to determine and update the rules stored in said storing means (11) during active operations.

4. The apparatus according to claim 1, wherein said routing means (13) is arranged to modify the special data packets in accordance with the received instructions.

5. The apparatus according to claim 1, wherein said routing means (13) is arranged to communicate with an external charging entity (3) for charging the routing of the special data packets.

6. A method for receiving a plurality of data packets and for routing the data packets in a data network, comprising the steps of:

storing (S1) a pre-defined list of rules for detecting special data packets;

detecting (S3) special data packets in the received plurality of data packets on the basis of the stored pre-defined list of rules; and

requesting (S4) instructions for the detected special data packets and routing (S5) the special data packets in accordance with instructions received on request,

characterized by the steps of:

in the requesting step, notifying an internal entity (14) of the detected special data packets and requesting instructions for the special data packets from said internal entity (14),

wherein the instructions stored in said internal entity (14) are determined and updated by an external entity (2) during active operations.

7. The method according to claim 6, wherein said requesting step (S4) comprises the steps of:

notifying said external entity (2) of the detected special data packets; and

requesting instructions for the special data packets from said external entity (2).

8. The method according to claim 6, wherein the rules stored in said storing step are determined and updated by said external entity (2) during active operations.

9. The method according to claim 6, wherein said routing step (S5) comprises the step of:

modifying the special data packets in accordance with the received instructions.

10. The method according to claim 6, comprising the further step of:

communicating with an external charging entity (3) for charging the routing of the special data packets.

11. A data network system in which an apparatus according to any one of claims 1 to 5 is employed.

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CLAIMS:

1. An apparatus (1) for receiving a plurality of data packets
and for routing the data packets in a data network,
5 comprising:
 storing means (11) for storing a pre-defined list of
rules for detecting special data packets;
 detecting means (12) for detecting special data packets
in the received plurality of data packets on the basis of the
10 pre-defined list of rules stored in said storing means (11);
and
 routing means (13) for requesting instructions for the
special data packets detected by said detecting means (12)
and for routing the special data packets in accordance with
15 instructions received on request.
2. The apparatus according to claim 1, further comprising an
internal entity (14); wherein said routing means (13)
notifies said internal entity (14) of the detected special
20 data packets and requests instructions for the special data
packets from said internal entity (14).
3. The apparatus according to claim 1, wherein said routing
means (13) notifies an external entity (2) of the detected
25 special data packets and requests instructions for the
special data packets from said external entity (2).
4. The apparatus according to claim 1, wherein the rules
stored in said storing means (11) and the instructions stored
30 in said internal entity (14) can be determined and updated
from said external entity (2) during active operations.
5. The apparatus according to claim 1, wherein said routing
means (13) modifies the special data packets in accordance
35 with the received instructions.

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6. The apparatus according to claim 1, wherein said routing means (13) communicates with an external charging entity (3) for charging the routing of the special data packets.

5 7. An apparatus for receiving a plurality of data packets and for providing services for the data packets in a data network, comprising:

service deciding means (42) for deciding services to be executed for the received plurality of data packets; and

10 service executing means (43) launched by said service deciding means (42) for a decided service, said service executing means (43) executing the decided service for the received data packets;

wherein control means (5) are activated when said
15 service executing means are launched, said control means (5) controlling said service deciding means (42) and said service executing means (43).

8. The apparatus according to claim 7, further comprising a
20 database (41) for storing service deciding information for said service deciding means (42).

9. The apparatus according to claim 7, further comprising
service data storing means (44) for storing service specific
25 data that is used by said service executing means (43).

10. The apparatus according to claim 9, wherein said service specific data comprise static and dynamic data.

30 11. The apparatus according to claim 7, wherein said control means (5) is arranged to access user specific data (6) and to supply said user specific data to said service executing means (43).

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12. The apparatus according to claim 11, wherein the user specific data comprise user preferences regarding a specific service.
- 5 13. The apparatus according to claim 7, wherein said control means (5) is arranged to create new deciding information for said service deciding means (42).
- 10 14. A method of receiving a plurality of data packets and routing the data packets in a data network, comprising the steps of:
- storing (S1) a pre-defined list of rules for detecting special data packets;
 - 15 detecting (S3) special data packets in the received plurality of data packets on the basis of the stored pre-defined list of rules; and
 - requesting (S4) instructions for the detected special data packets and routing (S5) the special data packets in accordance with instructions received on request.
- 20 15. The method according to claim 14, wherein said requesting step (S4) comprises the steps of:
- notifying an internal entity (14) of the detected special data packets; and
 - 25 requesting instructions for the special data packets from said internal entity (14).
16. The method according to claim 14, wherein said requesting step (S4) comprises the steps of:
- 30 notifying an external entity (2) of the detected special data packets; and
- requesting instructions for the special data packets from said external entity (2).
- 35 17. The method according to claim 14, wherein the rules stored in said storing step and the instructions stored in

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said internal entity (14) can be determined and updated by said external entity (2) during active operations.

18. The method according to claim 14, wherein said routing
5 step (S5) comprises the step of:

modifying the special data packets in accordance with the received instructions.

19. The method according to claim 14, comprising the further
10 step of:

communicating with an external charging entity (3) for charging the routing of the special data packets.

20. A method of receiving a plurality of data packets and
15 providing services for the data packets in a data network, comprising the steps of:

deciding (S52) services to be executed for the received plurality of data packets;

launching (S54) a service decided for the received data
20 -packets;

activating (S55) control means (5) for the decided service; and

executing (S56) the decided service;

wherein said control means (5) control the deciding of
25 services and the execution of decided services.

21. The method according to claim 20, further comprising the
step of storing service deciding information for said
deciding step (S52).

30

22. The method according to claim 20, further comprising the
step of storing service specific data (44) that is used in
said executing step (S56).

35 23. The method according to claim 22, wherein said service specific data comprise static and dynamic data.

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24. The method according to claim 20, wherein said control means (5) is arranged to access user specific data (6) and to supply said user specific data to said executing step (S56).
- 5
25. The method according to claim 24, wherein the user specific data comprise user preferences regarding a specific service.
- 10 26. The method according to claim 20, wherein said control means (5) is arranged to create new deciding information for said deciding step (S52).
- 15 27. A data network system in which an apparatus according to any one of claims 1 to 6 is employed.
28. A data network system in which an apparatus according to any one of claims 7 to 13 is employed.

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PATENT COOPERATION TREATY

PCT

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühling-Kinne
Bavariaring 4
D-80336 Munich
ALLEMAGNE

RECEIVED

FEB 1 1 2003

Technology Center 2600

Date of mailing (day/month/year) 01 August 2002 (01.08.02)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference WO26444	
International application No. PCT/EP00/03478	
International filing date (day/month/year) 17 April 2000 (17.04.00)	
International publication date (day/month/year) 22 March 2001 (22.03.01)	Priority date (day/month/year) 13 September 1999 (13.09.99)
Applicant NOKIA CORPORATION et al	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
13 Sept 1999 (13.09.99)	PCT/EP99/06759	EP	25 June 2002 (25.06.02) *

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer Dominique DELMAS Telephone No. (41-22) 338.83.38
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TENT COOPERATION TRE Y

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühling-Kinne
Bavariaring 4
D-80336 Munich
ALLEMAGNE

Date of mailing (day/month/year) 10 January 2002 (10.01.02)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference WO26444	
International application No. PCT/EP00/03478	International filing date (day/month/year) 17 April 2000 (17.04.00)

1. The following indications appeared on record concerning:

☒ the applicant

 ☐ the inventor

 ☐ the agent

 ☐ the common representative

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NOKIA NETWORKS OY
Keilalahdentie 4
FIN-02150 Espoo
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State of Nationality

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State of Residence

FI

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Facsimile No.

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Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person

 ☒ the name

 ☐ the address

 ☐ the nationality

 ☐ the residence

Name and Address

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Keilalahdentie 4
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Finland

State of Nationality

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State of Residence

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Teleprinter No.

3. Further observations, if necessary:

Change of applicant's name (merger) has been recorded.

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

R. Chrem

Telephone No.: (41-22) 338.83.38

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PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year)
 20 June 2001 (20.06.01)

International application No.
 PCT/EP00/03478

Applicant's or agent's file reference
 WO26444

International filing date (day/month/year)
 17 April 2000 (17.04.00)

Priority date (day/month/year)
 13 September 1999 (13.09.99)

Applicant

BERGENWALL, Martin et al

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 12 April 2001 (12.04.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
 34, chemin des Colombettes
 1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Juan Cruz

Telephone No.: (41-22) 338.83.38

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PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühling-Kinne
Bavariaring 4
D-80336 Munich
ALLEMAGNE

Date of mailing (day/month/year)

10 January 2002 (10.01.02)

Applicant's or agent's file reference

WO26444

IMPORTANT NOTIFICATION

International application No.

PCT/EP00/03478

International filing date (day/month/year)

17 April 2000 (17.04.00)

1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

Name and Address

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2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☒ the name ☐ the address ☐ the nationality ☐ the residence

Name and Address

NOKIA CORPORATION
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State of Nationality

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Facsimile No.

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Teleprinter No.

3. Further observations, if necessary:

Change of applicant's name (merger) has been recorded.

4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned
☐ the International Searching Authority ☒ the elected Offices concerned
☒ the International Preliminary Examining Authority ☐ other:The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

R. Chrem

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